Amendments to the Specification

Please replace the paragraph beginning on page 1, line 4 with the following paragraph:

This application is a Continuation-In-Part of U.S. Application Serial No. 10/004,090, entitled DATA STORAGE DEVICE, filed October 23, 2001.

Please replace the paragraphs beginning on page 2, line 7 and ending on page 3, line 27 with the following new paragraphs:

In one aspect, the disclosure describes a data storage device including a device interface for receiving data access requests, a device housing conforming to a standard form factor, a plurality of non-volatile memory devices housed within the device housing and a controller that accesses the non-volatile memory devices in response to the received data access requests.

The interface may include an interface configured to conform to a protocol. The protocol may include at least one of the following: SCSI (Small Computer System Interface), Fibre Channel, and Infiniband. The plurality of non-volatile memory devices may include at least one of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; any type of volatile memories, such as dynamic and static RAM, maintained as non-volatile with the use of a power subsystem; mechanical memory devices and microelectromechanical memory devices. The device housing may conform to at least one of the following standard form factors: full-height, half-height, and low-profile. The controller may include a controller configured to implement a RAID scheme. The scheme implemented by the controller may include a RAID scheme independent of a hierarchically higher RAID controller that sends the data storage device RAID data. The data storage device may further include a cache manager. The cache manager may include a manager configured to perform at least one of the following: translate an address of a different storage device to a cache address; cache data included in a write request; load data from the different storage device; and remove cached data.

The data storage device may include a controller card that includes the controller and connections available to couple with more than one storage card that provides access to the plurality of non-volatile memory devices. The storage card may include a card having at least one parallel interface to a collection of the drives. The connection between the controller and the storage card may include a serial connection. The controller may include a bank interface that routes data requests to an appropriate bank of drives.

According to another aspect, the disclosure describes a data storage system including at least one first data storage device having a platter size of at least 3.5 inches in diameter and at least one second data storage device. The second data storage device includes a device interface for receiving data access requests; a device housing conforming to a standard form factor; a plurality of non-volatile memory devices housed within the device housing; and a first controller configured to receive data access requests from the device interface. The system also includes a second controller that coordinates data access to the at least one first data storage device and the at least one second data storage device.

The plurality of non-volatile memory devices may include at least one of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; any type of volatile memories, such as dynamic and static RAM, maintained as non-volatile with the use of a power subsystem; mechanical memory devices and microelectromechanical memory devices.

According to another aspect, the disclosure describes a method of servicing data access requests at a data storage device, the method including receiving data access requests at a device interface of the data storage device and accessing a plurality of non-volatile memory devices housed within a standard form factor device housing in response to the received data access requests.

The plurality of non-volatile memory devices may include at least one of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; any type of volatile memories, such as dynamic and static RAM, maintained as non-volatile with the use of a power subsystem; mechanical memory devices and microelectromechanical memory devices.

According to another aspect, the disclosure describes a data storage device including a device interface for receiving data access requests; a plurality of non-volatile memory devices and a controller that accesses the non-volatile memory devices in response to the received data access requests. The controller includes a controller configured to implement a RAID scheme.

The scheme implemented by the controller may include a RAID scheme independent of a hierarchically higher RAID controller that sends the data storage device RAID data.

According to another aspect, the disclosure describes a data storage device including a device interface for receiving data access requests; a plurality of non-volatile memory devices; and a controller that accesses the non-volatile memory devices in response to the received data access requests. The plurality of non-volatile memory devices include at least one of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; any type of volatile memories, such as dynamic and static RAM, maintained as non-volatile with the use of a power subsystem; mechanical memory devices and microelectromechanical memory devices.

According to another aspect, the disclosure describes a data storage device including a device interface for receiving data access requests; a plurality of non-volatile memory devices; and a controller that accesses the non-volatile memory devices in response to the received data access requests. The controller is configured to access the non-volatile memory devices in a manner that emulates access to a single disk drive.

Please add the following <u>new</u> paragraph after page 4, line 12:

FIG. 13 is a schematic diagram illustrating an alternative embodiment of the data storage device.

Please replace the paragraph beginning on page 10, line 1 with the following paragraph:

Despite conventional wisdom that holds high speed memory chip caches should be used to mask the slower speed of disk based data storage, using device 106 in a cache

132 can offer a number of potential advantages over memory chips. For example, as disks retain their contents absent power, the device 106 can offer greater data protection in the event of a power failure. The device 104 can also potentially enlarge the storage capacity of a cache. Additionally, depending on its configuration, the device 104 may also offer better thermal, power, and data density characteristics. Further, in the current marketplace, the device 106 may reduce the cost of a cache 132 relative to a memory chip implementation. Co-pending U.S. Application Serial No. 10/001,317, entitled "Disk Cache", describes such a cache in greater detail.

Please add the following new paragraphs after page 14, line 25:

An alternative embodiment of the data storage device is shown at 300 in FIG. 13. In this embodiment, a plurality of non-volatile memory devices, having a size that enables them to fit in the standard form factor previously described with reference to FIG. 1. As shown in FIG. 3, the data storage device 300 includes a plurality of non-volatile memory devices 302a-302n connected to a device controller 304. As shown, the non-volatile memory devices 302a-302n and controller 304 can be enclosed, for example, in a housing 306 previously designed to store fewer disks. For example, the housing 306 may conform to a standard form factor (e.g., full height drives, half-height drives, or low-profile). Alternatively, the housing 306 may feature some other, non-standard, form (e.g., a custom design for rack-mounting).

Non-volatile memory devices 302a-302n may include any type of non-volatile memory, including, but not limited to, flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; any type of volatile memories, such as dynamic and static RAM, maintained as non-volatile with the use of a power subsystem such as batteries or capacitance devices; mechanical memory devices and microelectromechanical memory devices. Non-volatile memory devices 302a-302n may include only one of these non-volatile memory types or any combination of these non-volatile memory types.

The device 300 controller 304 may provide a device interface that emulates a traditional disk 100, FIG. 1, interface. For example, the data storage interface may

conform to an interface protocol such as SCSI (Small Computer System Interface), Fibre Channel, Infiniband, and so forth. Thus, a system using the device 300 to store data could communicate with the device 300 as it would with a traditional device 100. This can permit a system manager to quickly upgrade the performance of a system by replacing a traditional disk 100 with device 300.

In operation, the device 300 will operate in a manner similar to the device 106, as previously described with reference to Figs. 1-6. Furthermore, the device 300 may be used in a wide variety of systems and in a wide variety of different capacities, such as those previously described with reference to FIGs. 7-12.